



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

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**PHYSICS**

**0625/51**

Paper 5 Practical Test

**May/June 2013**

**CONFIDENTIAL INSTRUCTIONS**

**Great care should be taken to ensure that any confidential information given does not reach the candidates either directly or indirectly.**



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If you have any problems or queries regarding these Instructions, please contact CIE  
by e-mail: [info@cie.org.uk](mailto:info@cie.org.uk),  
by phone: +44 1223 553554,  
by fax: +44 1223 553558,  
stating the Centre number, the nature of the query and the syllabus number quoted above.

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This document consists of **8** printed pages.



### Instructions for preparing apparatus

The Supervisor is **not** allowed to consult the Question Paper before the examination. This teacher should, as part of the preparation of the examination requirements, test the apparatus in order to ensure that it is satisfactory.

The Supervisor is asked to give (and attach to the Report form printed on pages 7 and 8) a *brief* description of the apparatus supplied, mentioning any points that are likely to be of importance to the Examiner in marking the answers. The Supervisor should also report any assistance given to candidates. All reports should be signed by the Supervisor and by the person responsible for preparing the apparatus.

In addition to the usual equipment of a physics laboratory, each candidate will require the apparatus specified in these Instructions. If a candidate breaks any of the apparatus, or loses any of the material supplied, the matter should be rectified and a note made in the Report.

### Number of sets of apparatus

As a *minimum*, the number of sets of apparatus provided should be  $N/4$ , where  $N$  is the number of candidates (per session). A few spare sets should, preferably, be available to avoid any candidate being delayed when moving to another question.

Centres may find it more convenient and easier to administer if  $N/3$  sets (plus one or two 'spares') of apparatus are provided.

The order in which a given candidate attempts the four questions is immaterial.

### Assistance to Candidates

The purpose of the Practical Physics test is to find out whether the candidates can carry out simple practical work themselves. The Examiners are aware that candidates may sometimes be unable to show their practical ability through failure to understand some point in the theory of the experiment. If an Examiner were present in the laboratory, he/she would be willing to give a hint to enable such a candidate to get on with an experiment. In order to overcome this difficulty, the Supervisor is asked to co-operate with the Examiners to the extent of being ready to give (or allow the Physics teacher to give) a hint to a candidate who is unable to proceed.

The following regulations must be strictly adhered to.

- (i) No hint may be announced to the candidates as a whole.
- (ii) A candidate who is unable to proceed and requires assistance must come up to the Supervisor and state the difficulty. Candidates should be told that the Examiners will be informed of any assistance given in this way.
- (iii) A report must be made of any assistance given to the candidate, with the name and candidate number of the candidate.

It is suggested that the following announcement be made to the candidates.

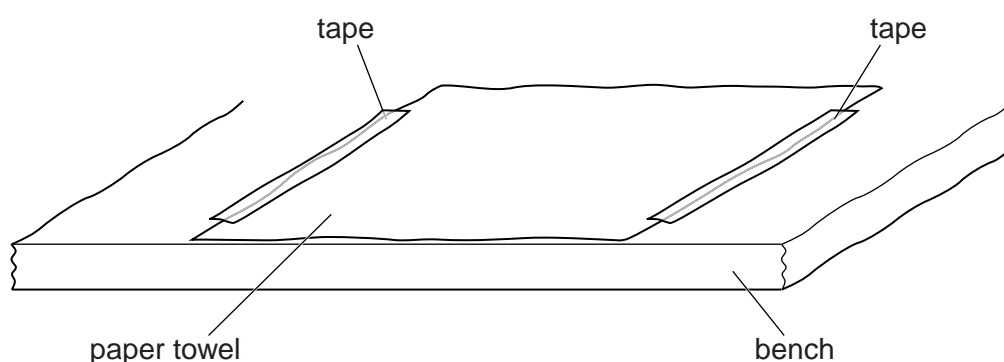
'The Examiners do not want you to waste time through inability to get on with an experiment. Any candidate, therefore, who is unable to get on with the experiment after spending five minutes at it may come to me and ask for help. I shall report to the Examiners any help given in this way, and some marks may be lost for the help given. You may ask me for additional apparatus which you think would improve the accuracy of your experiments, and you should say, on your script, how you use any such apparatus supplied.'

**1 Items to be supplied by the Centre (per set of apparatus unless otherwise specified)**

- (i) Rectangular, transparent glass or Perspex block 10 cm × 6 cm × 1.5 cm or similar size.
- (ii) Protractor (candidates may use their own).
- (iii) Paper towel (candidates will tip the block over during the experiment. The paper towel is to prevent damage to the block). See note 1.
- (iv) Board (optional). See note 2.

**Notes**

1. The paper towel should be taped to the bench as shown in Fig. 1.1.



**Fig. 1.1**

2. If the bench has a rounded edge, the paper towel should be taped to a board with a flat edge.

**Action at changeover**

None.

**2 Items to be supplied by the Centre (per set of apparatus, unless otherwise specified)**

- (i) Thermometer,  $-10^{\circ}\text{C}$  to  $110^{\circ}\text{C}$ , graduated in  $1^{\circ}\text{C}$  intervals.
- (ii)  $250\text{ cm}^3$  beaker, with the  $200\text{ cm}^3$  level clearly marked and labelled.
- (iii) Clamp, boss and stand.
- (iv) Stopclock, stopwatch or wall-mounted clock showing seconds. Candidates will be required to take readings at 30s intervals. They may use their own wristwatch facility if they wish. The question will refer to a stopclock.
- (v) Supply of hot water (see notes 1 and 2).
- (vi) Supply of paper towels to mop up any spillages of water.
- (vii) 30 cm ruler, graduated in mm (candidates may use their own).

**Notes**

1. The hot water is to be supplied for each candidate by the Supervisor. The candidates will be required to refill the beaker with  $200\text{ cm}^3$  of hot water during the experiment. The water should be maintained at a temperature as hot as is reasonably possible.
2. Candidates should be warned of the dangers of burns or scalds when using very hot water.
3. The clamp, boss and stand are to be set up with the thermometer held in the clamp. The candidates must be able easily and safely to read temperatures up to  $100^{\circ}\text{C}$  and to move the thermometer in and out of the water without the danger of the beaker tipping. The candidates must be able easily and safely to remove the thermometer from the clamp.

**Action at changeover**

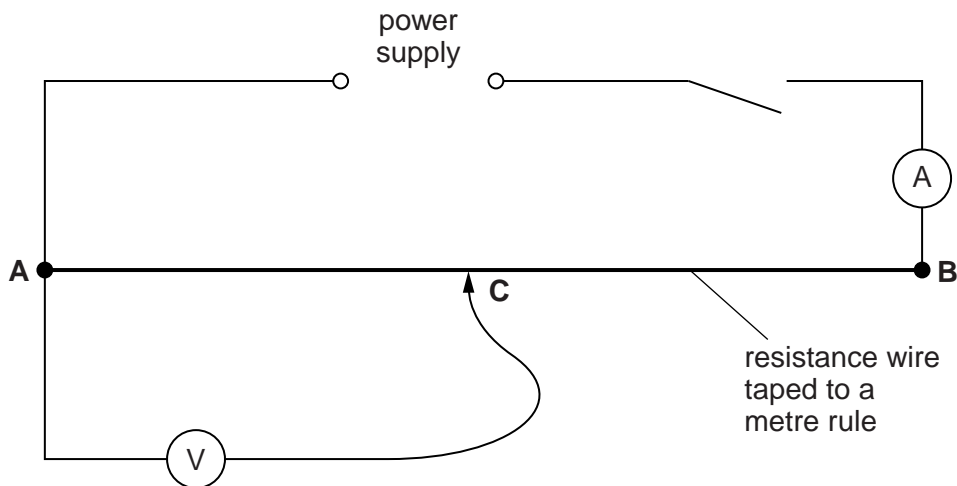
Replace the thermometer in the clamp. Empty the beaker. Check the supply of hot water.

### 3 Items to be supplied by the Centre (per set of apparatus unless otherwise specified)

- (i) Power supply of approximately 1.5V – 2V. Where candidates are using a power supply with a variable output voltage, the voltage setting should be set by the Supervisor and fixed (e.g. taped).
- (ii) Voltmeter capable of measuring the supply p.d. with a minimum precision of 0.1V (see note 2).
- (iii) Ammeter capable of measuring the current in the circuit shown in Fig. 3.1 with a minimum precision of 0.02 A (see note 2).
- (iv) Switch. The switch may be an integral part of the power supply.
- (v) Approximately 105 cm of straight, bare constantan (Eureka) wire, diameter 0.45 mm (26 swg) or 0.38 mm (28 swg) or 0.32 mm (30 swg), taped to a metre rule only between the 3 cm and 7 cm marks and between the 93 cm and 97 cm marks. The end of the wire at the zero end of the rule is to be labelled **A**, the other end is to be labelled **B**.
- (vi) Two suitable terminals (e.g. crocodile clips) attached to the constantan wire at the ends of the metre rule so that connections can be made to the circuit shown in Fig. 3.1.
- (vii) Sliding contact, labelled **C**. This may be a jockey or a small screwdriver connected to a lead by means of a crocodile clip.
- (viii) Sufficient connecting leads to set up the circuit shown in Fig. 3.1.

### Notes

1. The circuit is to be set up for the candidates as shown in Fig. 3.1.



**Fig. 3.1**

2. Either analogue or digital meters would be suitable. Any variable settings should be set by the Supervisor and fixed (e.g. taped).

### Action at changeover

Check that the circuit is set up as shown in Fig. 3.1.

**4 Items to be supplied by the Centre (per set of apparatus, unless otherwise specified)**

- (i) Plane mirror with a suitable holder (see note 1).
- (ii) Sheet of plain A4 paper with a hole in one corner (one per candidate). Some spare sheets should be available.
- (iii) 4 optics pins.
- (iv) Pin board (e.g. a cork mat), A4 size or larger.
- (v) Protractor (candidates may use their own).
- (vi) 30 cm ruler, graduated in mm (candidates may use their own).
- (vii) Treasury tag or string (to be used by the candidate to tie the ray-trace sheet into the question paper, one per candidate).

**Notes**

1. The mirror should be capable of standing vertically with one edge on the sheet of paper.

**Action at changeover**

Supply a sheet of plain paper, as in (ii) above. Supply a treasury tag or string, as in (vii) above.

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**This form must be completed and returned with the scripts.**

**REPORT ON PRACTICAL PHYSICS**

(IGCSE MAY/JUNE 2013)

*General*

The Supervisor is required to give details of any difficulties experienced by particular candidates giving their names and candidate numbers. These should include reference to:

- (a) difficulties due to faulty apparatus;
- (b) accidents to apparatus or materials;
- (c) any other information that is likely to assist the Examiner, especially if this cannot be discovered in the scripts;
- (d) any help given to a candidate.

*Information required*

A plan of workbenches, giving details by candidate number of the places occupied by the candidates for each experiment for each session, must be enclosed with the scripts.

The space below can be used for this, or it may be on separate paper.



*Information required (cont.)*

A list by name and candidate number of candidates requiring help, with details of the help provided.

CENTRE NO. ....

NAME OF CENTRE .....

*Declaration (to be signed by the Supervisor and the person responsible for preparing the apparatus)*

The preparation of the practical examination has been carried out so as to maintain fully the security of the examination.

SIGNED .....  
Supervisor

SIGNED .....  
Person responsible for preparing the apparatus

